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DEVELOPMENTAL ALEXIA: CONGENITAL WORD-BLINDNESS, OR INABILITY TO LEARN TO READ—*Concluded*

CLARA SCHMITT
Department of Child-Study, Chicago

With the cases described in the May number it was not possible to give any specialized help. Those who had extra instruction in reading had it only as a matter of quantity. The methods pursued were the same as are followed in all first grades without any change of method so far as the writer could learn. Cases 9, 10, 11, and 12, were placed in a special room with a teacher who had given special attention to methods of teaching reading. This placement was possible because all these children were found in the same school. In no other instance was more than one such child found in a school, and it was not considered expedient to place the child with subnormal children. In these cases it was felt that no injustice would be done, since a large part of the members of the room were not definitely subnormal, but backward for a variety of reasons. Some of the backward ones were as poor in reading as the subjects of this article, but from physical or other causes. The room was given in charge to Mrs. Lelah C. Russell. Mrs. Russell's account of her method is given, condensed from an article read by her before a teachers' meeting.

Learning to read is the child's all-important task when he enters school life. This task must be made interesting and a genuine pleasure. Sense training, games and plays, imagination and reasoning, are the avenues through which the quality of interest in the reading process is obtained. The love of play should be provided for by the introduction of lessons that are to be read silently and acted before being read orally. The play interests should be correlated with the work of learning to read, and the reading matter, then, should be full of action, the action of real life. The first words of sentences presented to the child should be ones for him to act.

On cards 3 inches by 4 inches print a number of action words in large type. On the other side of the card write same word in large script, as "run," "fly," "come," "walk," "jump," etc. Present the printed card to the class and write the word on the board in a large hand, thus presenting both print and script simultaneously. Call upon some child to do what the word says. If you happen to have a child who was in the first grade the year before ask him to act the command. Then have the child tell what the word told him to do. If you have no pupil in the class who knows the word, you may call a pupil to the front to act as teacher and ask you to act the word. Then have the child tell you what the word told you to do. Have a number or all the pupils to act the command, erase the word from the blackboard and rewrite it for each child to act. Very soon all action words will be recognized by sight. Later print short sentences to be acted, as, "run away," "come to me," etc. Be careful in preparing these lessons to preserve the continuity of thought. Mere isolated sentences scatter the interest, directing the mind first to one subject then to another, diverting the interest instead of holding it. After taking up a dozen words or so the sentences should be conversational. Along with this work and beginning with it the phonic side of reading should be taken up. The easiest sounds should be taught first. The easiest are those which can be prolonged indefinitely, such as, *r*, *f*, *l*, *m*, *s*. In the effort to make the work interesting and enjoyable the phonics are presented in a story, associating each sound with parts of the story. The story is told as a serial, stopping at an interesting point at the end of each period. The capital and small letters of the alphabet are printed on cards, one to a card, including the combinations *sh*, *wh*, *th*, *ch*. On the reverse side of the card the capital and small letter are written in script. The story goes as follows:

When I was a little girl just about as big as you little people, we lived on a farm. My brother, who was two years older than I, had a dog whose name was Spot. I had a dear little kitten, Tabby. One day Bert, my brother, and I were playing in the orchard. You know what an orchard is, don't you? Yes, that's right, it is a big yard full of fruit trees. Now can you guess why we liked to play in the orchard? Yes, that's right, you know little boys and girls like cherries and apples.

All at once we heard old Spot saying "r, r, r." Did you ever hear a dog growl like that? (show letter) What did he say? (write letter on board) (Children keenly interested repeat "r, r, r," associating the sound with the letter.) We ran quickly to the place from which the sound came and what do you think? There was Spot standing on his hind legs with his forepaws stretched high up on the tree still saying (present card r).

Bert laughed to see old Spot but I cried when I looked up in the tree and saw my Tabby with her back arched like a Hallowe'en kitty and her tail twice as big as it ought to be saying "f, f, f" (show card and write letter on board). I made Spot get down and scolded him for frightening my kitty. Bert climbed up into the tree and handed me Tabby. While he was getting her he spied some ripe cherries. He ate so many and ate them so fast that he swallowed a seed and while he was trying to get it out of his throat he said "c, c, c" (present card, etc.). So he came down and didn't eat any more cherries.

Just then we heard mother ring the bell, which meant that dinner was ready. It said "l, l, l." We all scampered to the house. When we got there Spot was very tired. I heard him say "h, h, h," so I knew he wanted a drink.

Mother told Bert to go to the barn and feed old bossy cow who had been saying "m, m, m" for a long time.

The story goes on in this fashion day after day, each lesson reviewing sounds already learned and adding new ones. Simultaneous with the teaching of phonics should be taken up the training of the ear in the analysis of the sounds of form words. Give a few ear-training sentences: "F-old your hands," "F-old your arms," "R-un to me." Have the sentence acted by individuals and the class. Then spend some time in pronouncing out the sounds of phonetic words alone, not in sentences, and have the pupils tell the word which they make.

When the ear has been trained to hear words when sounded, proceed with graphic word building. This training is carried on by writing phonic words on the board and have the children blend and pronounce. The Aldine Chart is very helpful for this drill or one may print lists of phonetic words on strips of cardboard, such as all words ending in the phonograms *at*, *an*, *all*, *et*, etc. A list of such words is as follows: "at," "bat," "cat," "fat," "rat," "mat." The child learns the phonogram or "family" *at* with which other sounds may be combined.

The various lines of training are carried on at the same time. During the day, at one period action sight words are being learned, at another ear training is given etc.

Mrs. Russell's method, as the writer has gleaned from observations of her work with the class, is, in short, to build up in the child's mind a complex of associations with which to connect up the new matter taught. The foregoing description of the method only palely portrays the constant vividness with which sounds and words are associated with experience and ideas already possessed by the child, and the devices for giving the child motor or other experience in connection with the reading to be taught.

The four children given her during the first six months of their residence in the special room showed a good beginning in the mastery of phonics as may be seen from the detailed reports of their reactions to the reading tests. They had gained in that time about the same in reading ability as is gained by first-grade children in the first half-year of their school life. Since they had gained almost nothing in their previous school life and had been making no observable progress up to the time of their residence in the special room, the new acquisition must be credited to the specialized teaching received there. After this period of residence the children showed a different quality in their reactions to the reading tests.

It was as though they had learned that this process was one with which they could cope, and they, therefore, worked at it with apparent confidence in their ability to master what was given them. The other children upon being asked to read showed a feeling of despair or a sort of discouraged resignation to an impossible attempt.

Case 9: Girl.—Age ten years and six months when first seen in April, 1915. She had been sixty-nine weeks in the second grade. She had acquired second-grade arithmetic, but the reading was so poor that her teacher desired that she be placed in the special room. Physically she was a plump, well-nourished child, but with hands so moist as to be almost dripping. Along with this she showed a certain amount of nervousness, wriggling and twisting continually, nervously inattentive at times, but could at times when interested in tests fasten herself down and work out the problem with continuity of attention. A brother of twelve years was a very nervous and erratic boy, but not mentally subnormal. He was in the fifth grade and had to repeat half-grades several times, but then always got through. A sister of fourteen had very poor vision which could not be corrected and was for this reason doing little school work. A brother of seven is Case 10. She did the Construction Puzzle B of the Healy-Fernald Series with no error, and cross-lines A and B at the first attempt. She read Selection A in 3 minutes and 20 seconds with five errors. With the first sentence of Selection B, she could not pronounce "Bliss," "manager," "northern," "spectator," "planting," "potatoes." At this time it was the opinion of the examiner that the child's backwardness in school probably was due to the nervousness and consequent lack of concentration of attention.

She was seen again in September, 1915, a member of the third grade, and was doing well with the arithmetic and other work of the grade. The reading had not improved. Her teacher said that she had not noticed that her control of attention was poor. She found her always attentive and diligent with the work which was possible for her to do without reading ability.

She was seen again in January, 1916. She was making good progress in the work of the grade. The teacher reported again that the child applied herself well but there was no improvement in reading ability. She was then recommended for residence in the special room.

She was seen again in June, 1916, after nearly six months of the kind of instruction described. She read Selection A in 1 minute and 15 seconds with no errors. She had not seen it since her last examination and since leaving the first grade had seen it only upon such occasions. Read Selection B in 9 minutes and 26 seconds, spelling out correctly such words as "heard," "turning," "became," "dimly," "villages," "wandering," "quickly"; failed with such words as "proprietors," "spectator," "conscious," "neighbors," "continued." She was continuing her progress in arithmetic. At this time she did the code test with four errors, which shows fair ability at concentration of attention.

She was seen again in December, 1916. She read Selection B in 9 minutes with a phonetic ability not especially better than at the time of her last examination. At this time the child left the school without leaving the address of her new home and has not since been located.

Case 10: Boy.—Age seven years and six months when first seen in April, 1915. Brother of Case 9. He had then been in the first grade for seventy weeks. Physically he was in very good condition. He showed much of the same nervousness as characterized his sister. He knew as much of the number work as could be expected of a child with only first-grade experience. He showed a tendency to talk much. When doing tests he would go off on tangents of discussion, and because of this frequently missed the point through this type of inattentiveness. By reason of this he failed in the counting-backward test, though he got part way correctly several times. He failed with the Healy-Fernald Construction Puzzle B, but after being once shown did it again immediately with the board turned upside down with reference to its previous position without error. He gave good answers to the difference test. He answered five of ten easy opposites correctly; gave four of the other five correctly with the stimulating question, *If a thing is not—then how is it?* He could, however, always be brought back to the problem at hand, and during the time when attention was controlled good results were apparent. In reading he could recognize possibly five words unerringly. He had no idea of phonics.

He was seen again in January, 1916. There was no improvement in reading, and he was recommended for the special room.

He was seen again in June, 1916. He read Selection A with errors for only four of the words. He pronounced "saw" "was," and could not get it correct phonetically; pronounced "some" correctly, and then wished to verify it phonetically but could not because it is not phonetically logical. He had the same difficulty with "were." He read the first sentence of Selection B in 4 minutes and 35 seconds, working out phonetically correct "fine," "spring," "morning," "year," "about," "ten," "near," "Amos," "Bliss," "have," "been," "seen," "behind," "his." He failed with "proprietors," "northern," "spectator," "might," "planting," "potatoes."

In December, 1916, this child suffered an accident and was out of school for a long time and then left the district and was not located again. His teacher reported that he had continued to make progress in reading, and before he left her was quite independent with the phonics of difficult matter.

Case 11: Boy.—Age seven years and three months when first seen in January, 1916. He had been in the first grade for fifty-seven weeks. Physically he was in very good condition, a strong, healthy-looking child. No other member of the family was in school. His teacher reported him as very good in the handwork of the grade. He knew much more of number work than was taught in the first grade at that time. His reading accomplishments consisted of the ability to recognize possibly a few words. He counted backward from 10; gave answers to the difference test in good, clear sentences; did the Healy-Fernald Construction Puzzle B with thirteen errors—not a bad record. He did cross-line A at the second attempt; failed with cross-line B. He gave correct answers to five of ten easy opposites, answered three of the other five with the stimulating questions, and did not know the opposite of "truth" and "sad." He did not name the color gray, but called it "light black," and called orange "pink." He was placed in the special room.

When seen again in June, 1916, he read Selection A in 9 minutes and 45 seconds, spelling out most of the words phonetically correct but not conventionally correct. For instance, the words "find," "fine," "like" were pronounced with short *i*. He was unable to work out such words as "hungry," "said," "could," "grapevine," "high." He was able to recognize these words when they occurred a second time in the selection, the examiner having pronounced them for him at his first failure. He was making normal progress in other subjects of the school work. He left the city soon after this time and was not seen again.

Case 12: Boy.—Age eight years and eleven months when first seen in January, 1916. He had then been in the second grade for twenty-six weeks and before that fifty-four weeks in the first grade. Physically he was in good condition—a strong, healthy-looking child. The aunt with whom he and his mother live said that he had typhoid fever at five years, children's diseases in mild form, but had in general always been a healthy child. In most tests of reasoning and thinking ability he showed himself to be very apt. He did Construction Puzzle B of the Healy-Fernald Series with one error; failed, however, with the cross-line B. He succeeded with the absurdities test of the Terman ten-year set. He was reported by his teacher as very good in number and hand-work, neat and reliable and diligent. His reading accomplishment consisted of the ability to recognize only a few words, with no knowledge of phonics. He was recommended for the special room.

When seen again in June, 1916, he read Selection A in 9 minutes and 49 seconds, failing to recognize such words as "could," "grapes," "high," "knew," "better." He spelled out phonetically correct "grapevine," shortening the vowels, "air," "those," "get," "last," "not." At this time he did cross-line A and cross-line B correctly at the first attempt. He had made normal progress in number work.

When seen again in December, 1916, he read Selection A in 3 minutes and 12 seconds without any mispronunciations but studied many of the words carefully before pronouncing them. He read the first sentence of Selection B in 3 minutes and 30 seconds, working out correctly "spring," "year," "about," "ten," "Amos," "Bliss," "manager," "proprietors," "northern," "spectator," "garden," "planting," "potatoes." He wrote correctly from dictation, "The cat ran away." When asked to write "The printer made some cards," he wrote "The printr made som cards." Before writing the unfamiliar words he dissected them phonetically, audibly. He had made normal progress in the number work and other subjects of the school curriculum.

He was seen again in February, 1917. Unfortunately his record with Selections A and B has been lost. His record with the reading test of the ten-year group of the Terman Scale is as follows: Time, 3 minutes and 15 seconds. Spelled out phonetically correct "September," "fire," "near," "center," "families," "saving," "burned," "hands"; missed only one word in the selection. Gave an adequate account involving eight items. He showed his quickness of comprehension in his reaction to tests in many ways. For instance, when given the Healy Apperception Test, before an explanation could be made of the meaning of the test, he had glanced over it and remarked, "Oh, this is easy. I see how it goes," and proceeded to fill the requirements of the test without any error.

Case 13: Boy.—Age seven years and nine months when seen in February, 1917. Brother of Case 12. He had just been placed in the second grade after two years' residence in the first. His teacher reported that he was especially good in construction work and in games, and the special teacher of drawing was enthusiastic about his ability in that subject. His ability with the number work of his grade was good, and his number accomplishments were in advance of what might have been expected from the teaching he had received in the first grade. He did Construction Puzzle B of the Healy-Fernald Series with fifteen errors. He did cross-lines A and B at the first attempt. Physically he was in good condition. His aunt reported that he had had typhoid at three years of age, the usual children's diseases in mild form, that he was artificially fed in infancy and that the food did not agree with him until about three months of age, from which time on he had been healthy. He was able to recognize about twenty words in the first pages of his reader. He had no knowledge of phonics. He was placed in the special room, and has not since been seen.

The foregoing data suggest a cause for inability to learn to read differing much from the generally accepted one. The cause assigned by most writers indicate a lesion in brain structure and is termed variously, "biologic variation," "phenomenon of atavism," "lack of development of left angular gyrus." Rieger assigns the condition to the field of general intelligence; Voss's free association experiment and Jackson's discussion suggest the same. Among those who entertain the idea of lesion of the reading center some have assigned the recognition of figures and musical characters to different centers than that for reading, since most congenital word-blind cases can recognize one or both of these types of symbols.

In the light of the reading ability developed by the children who received special teaching, one must doubt the theory of a specialized brain center lesion. We must assume in case of the lesion theory that, in the brain of the congenital word-blind child who has learned to read, connections with some other group of brain cells has been made by the stimulus-receiving center involved and that the new center then took over the specialized function of storing word images, a conception not in line with the trend of current thought concerning imagery; or that the center biologically set aside for this purpose has undergone a development of some sort. The latter is, of course, untenable.

The question which may be raised in objection to the former assumption is, How can the calling into function of a new center by the four children of different ages at the same time be accounted for when they had shown no such tendency during all their previous school history? There was in the special room no greater stimulus to learn to read than was supplied in the regular rooms; no greater amount of time was given to the subject except in so far as the class was smaller and each individual received more of the teacher's attention. All the children had been anxious to learn to read and were conscious of their failure to do so. The fact is that they all, with only slight variations, reacted in the same way to a new method. The writer has had frequently to maintain that the method is new in the face of objections from teachers with whom this matter has been discussed. They say that they all use the same method as was found successful with these children. Observation, however shows this not to be the case. Every teacher uses it to some extent, but to a very slight extent. It is not necessary with the usual first-grade child. The average child quickly learns to associate the printed letters and words with their vocal prototypes without the need of much trimming in the way of method. The extra devices to help the formation of such associations occupy about the same place in the usual teaching of reading as does the occasional humorous story in a serious lecture. It is, then, the unusual child who persistently fails to make the associations.

This failure on the part of a child who is otherwise normal may be related to the psychology of meaning and association. We know that the complex which goes to make up that mental quality termed "meaning" and associated with all percepts is composed of the many factors of experience in connection with the particular percept. It is made up of memories of smell, taste, color, tactual qualities, kinaesthetic experiences, relations to other objects of perception, etc. Along with these experiences and knitting them into a functional whole are the ideas of the individual's past and present purposes with reference to the object of perception. When a certain such complex has been repeated in its entirety many times it is probable that in many instances a mental set or attitude is formed and, becoming habitual, may be closed to the admission of additional factors whose addition would make necessary a reconstruction of the percept complex and the formation of a new attitude. This is commonly known to be the case with complex motor processes. A person who has formed a certain motor habit can only with difficulty or not at all reconstruct it, as witness inefficient golf, typewriting, handwriting, piano playing, etc.

Most books in beginning reading have for their first lessons the "I see a cat" type of material. This is for the purpose of connecting with the experiences and interests of childhood. The child's already-formed percept of cat is made up of certain experiences of furriness, scratchiness, color, etc., together with play purposes, its relation to the house, other pets, and a host of other ideas which have become a complex whole and which when called up brings with it a certain attitude or set of the whole mental organism. The new experience of the printed "cat" may not find lodgment in this already-formed mental habit percept "cat." That it does so in the preponderance of cases is evidence of juvenile mental plasticity. The children who exhibit the characteristics of congenital word-blindness have minds which have become set in certain respects. They may not be set in all such ways as would eliminate all printed language. This is shown by the fact that in nearly all cases reported there was ability to recognize figures and in some ability to read music. The explanation for this is that there were few or no experiences with number and music before the symbols were presented and therefore no habit percept formed. The printed symbols of such subjects is, with most children, presented along with the child's other experiences with the subject-matter and thus are made a part of the habit percept complex. One case reported learned to read Latin readily while still finding much difficulty with English. This case may be explained in the same way. Latin words and their printed symbols went to form a new percept and did not necessitate the rearrangement of old ones. For the same reason Case 2 learned to read material in connection with his electrical work.

These same children fail to learn the phonics necessary to the reading process because the already-formed speech motor habits have never been subjected to such processes of synthetic analysis as accompanies the learning of phonics and have never consciously been applied to such uses.[1]

The method pursued with Cases 9, 10, 11, and 12 was such as to build up a background of logical association—the panting of the dog, the mooing of the cow, etc., which, however, had to be appealed to many times before the association of the sound with the symbol became automatic. It was a frequent occurrence to hear the teacher say, when recognition became hesitant, "That is the tired sound; what the cow said," etc.

It is quite probable that many children have the same type of difficulty who do not come to notice because it is much less in degree or associated with other causal factors. The writer is convinced that children coming from homes speaking a foreign language encounter difficulties in learning to read English which cannot be accounted for wholly on the basis of having to learn a new language. Many such children have been found who could not read, who would talk little or none in school, but who would describe that favorite game of the slums, "Coppers and Bums," or other such vital activities in their own fluent street patois. The English of the school, in these cases, does not become associated with the meaning complexes of their lives. The same difficulty has been found to exist among the colored children now coming to the city from the rural districts of the South, where little educational opportunity exists. Some of these children, proving upon examination not to be mentally defective, attend school for long periods before beginning to take hold of the work.

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[1] Whatever may be said for the word and sentence methods it is really by the phonic method that children learn to read. The first two are useful as a part of the beginning instruction to show that reading has meaning, says something, as one hears the expression frequently used by teachers. It is only by the phonic method that the child becomes independent of the teacher.

The condition here discussed is, however, only one of many factors which combine to determine school progress.

Because of the foregoing considerations the term proposed by Jackson, "developmental alexia," is much more suitable than the one in general use.

ADDENDA

Since the foregoing discussion was prepared the work of Dr. Augusta Bronner entitled *Psychology of Special Abilities and Disabilities* has become available. Part of chapter vi on "Special Defects of Language Ability" is devoted to disability in learning to read (pp. 76–110). Dr. Bronner does not accept the explanation for this phenomenon advanced by medical men. She discusses five cases. Her Case 14 was poor in auditory memory and perception. He could not readily reproduce five digits; could not pronounce "Constantinople"; could not enunciate clearly; had no knowledge of phonics. Case 15 was poor in visual memory. Dr. Bronner thinks that this may be the cause of his inability to learn to read. She says, "In reading naturally it would be most difficult to convert all the pictures of various words into other than visual terms, hence the boy's great failure in this whole field." For the failure to learn to read on the part of the other cases reported no reason is indicated.

One may say in criticism of the reason advanced for the failure of Case 15 that it is doubtful if imagery plays a significant function in the process of learning to read. The process in its developed form consists of certain habit speech motor responses to certain visual stimuli. The process can conceivably be developed without calling into play to any great extent the power of visual imagery.

Case 12 has been returned to the regular grades and will complete the work of Grade IV by the end of the year. There is no reason to expect that he will not continue to make normal progress. Case 13 is doing the work equivalent to Grade III in the special room. When seen recently he read the reading test of the Terman Scale in 3 minutes with two errors, carefully working out the unfamiliar words phonetically.